CENTER FOR DRUG EVALUATION AND RESEARCH

APPLICATION NUMBER: 74467

DRAFT FINAL PRINTED LABELING



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RANITIDINE TABLETS, USP

7162-6



ada 29 **1997**

DESCRIPTION: Ranitidine hydrochloride is a histamine H₂-receptor antagonist. Chemically it is *N*-{2-[[(5-[(Dimethylamino)methyi]-2-turany] methyi | hip lethyl|-*N*-methyi-2-nitro-1,1-ethenediamine, hydrochloride.
Ranitidine HCl is a white to pale yellow, crystalline substance that is very soluble in well-nt it has a slightly bitter taste and sulfur-like odor. It has the following structural formula.

CHNO₂ (CH₃)₂NCH₂ O CH₂SCH₂CH₂NHCNHCH₃

C₁₃H₂₂N₄O₃S • HCI

M.W. 350.87

C₁₃H₂₂N₄O₃S ● HCI M.W. 350.87

Each tablet, for oral administration contains 168 mg or 336 mg ranktione hydrochloride equivalent to 150 mg and 300 mg ranktione, respectively, linactive ingredients: D & C Red #30 Aluminum Lake, hydroxypropy dellulose, hydroxypropy hydroxypropy hydroxypropy hydroxypropy hydroxypropy hydroxypropy hydroxypropy hydroxypropy hydroxypropy hydroxypropy

Effect of Oral Ranitidine on Gastric Acid Secretion

•	Time after Dose, h		% Inhibition of Gastric Acid Output by Dose, mg		
		75-80	100	150	200
Basal	Up to 4		99	95	
Nocturnal	Up to 13	95	96	92	
Betazole	Up to 3		97	99	
Pentagastrin	Up to 5	58	72	72	80
Meal	Up to 3		73	79	95

Meal Up to 3 12 12 19 80

It appears that basal-, nocturnal-, and betazole-stimulated secretions are most sensitive to inhibition by ranificine, esponding almost completely to doses of 100 mg or less, while pentagastrin- and food-stimulated secretions are more difficult to suppress.

2. Effects on Other Gastrointestinal Secretions:
Pepsir: Oral ranificine does not affect pepsin secretion. Total pepsin outpeting the proportion to the decrease in volume of gastric piece.

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Other Pharmacologic Actions:

a. Gastric hacterial flora — increase in nitrate-reducing organisms, significance not known.

b. Prolactin levels — no effect in recommended oral or IV dosage, but small, transiert, dose-related increases in serum gonadotropins, TSH, or GH. Possible impairment of vasopressin release.

4. No change in corticol, aldosterone, androgen, or estrogen levels.

e. No antiandrogenic action.

1. No effect on count, motibily, or morphology of sperm.

Pharmacokinetics: Ranificine is SGV, absorbed after oral administration, compared to no orunt motibility, or morphology of sperm.

Pharmacokinetics: Ranificine is SGV, absorbed after oral administration, compared to 10 bours after a 150 mg dose. The elimination half-life is 25 to 3 hours.

Absorption is not significantly impaired by the administration food or antacids. Propatheline significantly impaired by the administration food or antacids. Propatheline significantly impaired by the administration food or antacids.

compared to an IV injection with mean peak levels of 440 to 545 ng/mL occurring at 2 to 3 hours.

2.5 to 3 hours.

Absorption is not significantly impaired by the administration of food or antacids. Propartheline slightly delays and increases peak blood levels of ranktidies, probably by delaying gastric emplying and transit time. In one study, simultaneous administration of high-potency antacid (150 mmol) in fasting subjects has been reported to decrease the absorption of ranktidies. Serum concentrations necessary to inhibit 50% of stimulated gastric acid secretion are estimated to be 35 to 94 ng/mL. Following a single oral dose of 150 mg, serum concentrations of ranktidine are in this range up to 12 hours. However, thood levels bear no consistent relationship to dose of 150 mg, serum concentrations of ranktidine are in this range up to 12 hours. However, thood levels bear no consistent relationship to dose of degree of acid inhibition.

The principal route of excretion is the urine, with approximately 30% of the orally administered dose collected in the urine as unchanged drug in 24 hours. Aenal clearance is about 410 ml.mmi, indicating active tribular clearance and clearance is about 410 ml.mmi, indicating active tribular creatione clearance 25 to 35 ml./mmi) administered 50 mg/mmi and promote of continue clearance of 29 ml/min, and a volume of distribution of 1.76 L/kg. In general these parameters appear to be alterned in proportion to creatinine clearance (see DOSAGE AND ADMINISTRATION).

In man, the Houside is the principal metabolite in the urine, however, this amounts to less than 4% of the dose. Other metabolites are the S-oxide (1%) and the desmethyl rannificine (1%). The remainder of the administered dose is found in the stool. Studies in patients with hepatic dysfunction (compensated crimbasi) indicate that there are minor, but clinically indicated crimbasi) indicate that there are minor, but clinically indicated and the search of the administered and consense of 150 ml.m. The administered than admin

The principal route of excretion is the urine, with approximately 30% of the orally administered dose collected in the urine as unchanged drug in 24 hours. Renal clearance is about 410 mJ/min, indicating active tubular excretion, Four patients with clinically significant renal function impairment (creatinine clearance 25 to 35 mJ/min) administered 50 mg of rankfurie intravenously had an average plasma half-life of 4.8 hours, a rankfuride clearance of 29 mJ/min, and a volume of distribution of 1.76 L/kg, in general, these parameters appear to be altered in proportion to creatinine clearance (See DOSAGE AND ADMINISTRATION).

In man, the N-oxde is the principal metabolite in the urine; however, this amounts to less than 4% of the dose. Other metabolites are the S-oxide (1%) and the desembly rankfurie (1%). The remainder of the administered dose is found in the stool. Studies in patients with hepatic dysfunction (compensated cirrhosis) midicate that there are minor, but clinically indicated cirrhosis of midicate that there are minor, but clinically indicavailability.

The volume of stribution is about 1.4 L/kg. Serum protein binding averages 15%.

Clinical Trials:

Clinical Inals: Active Duodenal Ulcer: In a multicenter, double-blind, controlled, US study of endoscopically diagnosed duodenal ulcers, earlier healing was seen in the patients treated with ranitidine as shown in the following table:

	Ranitidine*		Placebo*		
	Number Entered	Healed/ Evaluable	Number Entered	Healed/ Evaluable	
Outpatients Week 2 Week 4	195	69/182 (38%)† 137/187 (73%)†	188	31/164 (19%) 76/168 (45%)	

^{*}All patients were permitted p.r.n. antacids for relief of pain. $\pm p < 0.0001$.

In these studies patients treated with ranitidine reported a reduction in both daytime and noctumal pain, and they also consumed less antacid than the placebo-treated patients.

Mean Daily Doses of Antacid

	Ulcer Healed	Ulcer Not Healed
Ranitidine	0.06	0.71
Placebo	0.71	1.43

Foreign studies have shown that patients heal equalty well with 150 mg b.i.d. and 300 mg h.s. (85% versus 84%, respectively) during a usual 4-week course of therapy. If patients require extended therapy of 8 weeks, the healing rate may be higher for 150 mg b.i.d. as compared to 300 mg hs. (92% versus 87%, respectively).

Studies have been limited to short-term treatment of acute duodenal ulcer. Patients whose ulcers healed during therapy had recurrences of ulcers at the usual rates.

Maintenance Therapy in Duodenal Ulcer. Panitidine has been found to be effective as maintenance therapy for patients following healing of acute duodenal ulcers. In two independent, double-blind, multicenter, controlled trials, the number of duodenal ulcers observed was significantly less in patients treated with raintidine (150 mg h.s.) than in patients treated with patients realed with natifidine (150 mg h.s.) than in patients treated with

Duodenal Ulcer Prevalence

Double-blind, Multicenter, Placebo-controlled Trials					
Multicenter Trial	Drug	Duodenal Ulcer Prevalence			No. of Patients
			0-8 Months	0-12 Months	
USA	RAN PLC	20% · 44%	24%* 54%	35% 59%	138 139
Foreign	RAN PLC	12%* 56%	21%° 64%	28%* 68%	174 165

% = Life-table estimate.
* x p<0.05 (Ranttidine versus comparator).

RAN = ranttidine.

PLC = placebo.

As with other Hy-antagonists, the factors responsible for the significant reduction in the prevalence of duodenal ulcers include prevention of recurrence of ulcers, more rapid healing of ulcers that may occur during maintenance therapy, or both.

*Gastric Ulcer: In a multicenter, double-blind, controlled, US study of endosopically diagnosed gastric ulcers, earlier healing was seen in the patients treated with rankfidine as shown in the following table:

	Ranitidine*		Placebo*		
	Number Entered	Healed/ Evaluable	Number Entered	Healed/ Evaluable	
Outpatients Week 2		16/83		10/83	
Week 6	92	(19%) 50/73 (68%)	94	(12%) 35/69	

^{*} All patients were permitted p.r.n. antacids for relief of pain. $\uparrow p = 0.009$.

In this multicenter trial, significantly more patients treated with ranifidine became pain-free during therapy. Pathological Hypersecretory Conditions (such as Zollinger-Ellison syndrome): Ranifidine inhibits gastric acid secretion and reduces occurrence of diarrhea, annorsia, and pain in patients with pathological hypersecretion associated with Zollinger-Ellison syndrome, systemic mastocytoxis, and other pathological hypersecretory conditions (e.g., postoperative, "short-qui" syndrome, diagnathic). Use of ranifidine was followed by healing of ulcers in 8 of 19 (42%) patients who were intractable to previous therapy. Gastroesophageal Refutu Disease (GERD). In two multicenter, double-blind, placebo-controlled, 6-week trials performed in the United States and Europe, ranifidine 150 mg b.i.d. was more effective than placebo for the relief of hearthum and other symptoms associated with GERD. Ranifidine-treated patients consumed significantly less antacid than did placebo-treated patients.

patients.
The US trial indicated that rantifidine 150 mg b.i.d. significantly reduced the frequency of heartburn attacks and severity of heartburn pain within 1 to 2 weeks after starting therapy. The improvement was maintained throughout the 6-week trial period. Moreover, patient response rates demonstrated that the effect of heartburn extends through both the day and night time

that the effect of nearborn extends introduce both the day and inglin time periods. In two additional U.S. multicenter, double-blind, placebo-controlled, eweek trials, ranktidine 150 mg b.t.d. was shown to provide relief of heart-burn pain within 24 hours of initiating therapy and a reduction in the fre-quency and severity of hearbourn.

(See Reverse)

Erosive Esophagitis: In two multicenter, double-blind, randomized, placebo-controlled, 12-week trials performed in the United States, ranticine 150 mg q.i.d. was significantly more effective than placebo in healing endoscopi-cally-diagnosed erosive esophagitis and in relieving associated heartburn. The erosive esophagitis healing rates were as tollows:

EROSIVE ESOPHAGITIS PATIENT

	,,,	ALING IMILO			
	Healed/Evaluable				
Week 4 Week 8 Week 12		rlacebo* Raniti 150 mg n = 229 n = 2		q.i.d.*	
	43/198 63/176 92/159	(22%) (36%) (58%)	96/206 142/200 162/192	(47%) (71%) (84%)	

All patients were permitted p.r.n. antacids for relief of pain.
 p<0.001 versus placebo.

INDICATIONS AND USAGE: Rantidine tablets are indicated in:

1. Short-term treatment of active duodenal ulcer. Most patients heal within

4 weeks. Studies available to date have not assessed the safety of rantidine
in uncomplicated duodenal ulcer for periods of more than eight weeks.

2. Maintenance therapy for duodenal ulcer patients at reduced dosage after
healing of acute ulcers. No placebo-controded comparative studies have been
carried out for periods of longer than 1 year.

3. The treatment of pathological hypersecretory conditions (e.g., ZollingerEllison syndrome and systemic mastocytosis).

4. Short-term treatment of active, bening nastric ulcer. Most patients heal
within 6 weeks and the usefulness of further treatment has not been
demonstrated. Studies available to date have not assessed the safety of
rantidine in uncomplicated, bening nastric ulcer for periods of more than
6 weeks.

randome in uncomplicated, benigh gastric lucer for periods of more man 6 weeks.

5. Treatment of GERD. Symptomatic relief commonly occurs within 24 hours after starting therapy with randitidine 150 mg b.i.d.

6. Treatment of endocsopically-diagnosed erosive esophagits. Symptomatic relief to the starting of the starting occurs within 24 hours of therapy initiation. Occomitant antacids should be given as needed for pain relief to patients with active duodenal videor; active, bening gastric videor; hypersecretory states; GERD; and erosive esophagitis. CONTRAINDIACTIONS: Namidione tablets are contraindicated in patients known to have hypersensitivity to the drug or any of the ingredients (see PRECAUTIONS: General:

known to have hypersensitivity to the drug or any of the ingredients (see PRECAUTIONS).

PRECAUTIONS:

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General:

1. Symptomatic response to ranitidine therapy does not preclude the presence of gastric malignancy.

2. Since ranitidine is excreted primarily by the kidney, dosage should be adjusted in palents with impaired renal function (see DOSAGE AND ADMINISTRATION). Caution should be observed in palants with hepatic dystanction since ranitidine is metabolized in the liver.

3. Fair reports suggest that ranitidine may preciping should therefore be avoided in palients with a history of earth Reprinting and therefore be avoided in palients with a history of earth Reprinting and therefore testing with sufformation for the process of the programment of the process of the process of the process of the programment of the process of the proce

was without evect of the obscine of two manings per week in the local time weeks.

Pregnancy: Teratogenic Effects: Pregnancy Category B: Reproduction studies have been performed in rats and rabbits at doses up to 160 times the human dose and have revealed no evidence of impaired lertility or harm to the fetus due to rankindine. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Musching Mothers: Ranktidne is secreted in human milk. Caution should be exercised when ranktidne is administered to a nursing mother.

Pediatric Use: Salety and effectiveness in pediatric patients have not been established.

exercised with rantifume is administered to a nursing mother. Pediatric bies: Salety and effectiveness in pediatric patients have not been established.

Use in Elderty Patients: Ulcer healing rates in elderly patients (65 to 82 years of age) were no different from those in younger age-groups. The incidence rates for advise events and abtoratory abnormalities were also not different from those seen in other age-groups.

ADVERSE REACTIONS: The following have been reported as events in clinical trials or in the routine management of patients treated with rantificine. The relationship to rantificine therapy has been unclear in many cases. Headache, sometimes severe, seems to be related to rantifidine administration. Central Nervous System: Rarely, malaise, dizzness, somnolence, insomnia, and vertigo. Rare cases of reversible mental confusion, agitation, depression, and hallucinations have been reported. Preforminantly in severely ill elderly patients. Rare cases of reversible burred vision suggestive of a change in accommodation have been reported. Para reports of reversible involuntary motor disturbances have been received. Cardiovascutar: As with other Hz-blockers, rare reports of arrhythmias such as tachycardia, bradycardia, atrioventricular block, and premature ventricular beats.

Gastriontestinal: Constitution disturbances have been recreased to at least twice the preferament levels in 6 of 12 subjects receiving 100 mg q.i.d. intravenously for 5 days, and in 4 of 24 subjects receiving 100 mg q.i.d. intravenously for 5 days, and in 4 of 24 subjects receiving 50 mg q.i.d. intravenously for 5 days, and in 4 of 24 subjects receiving 50 mg q.i.d. intravenously for 5 days, and in 4 of 24 subjects receiving 50 mg q.i.d. intravenously for 5 days. There have been occasional reports of hepatitis, hepatic-cellular or hepatocanalicular or mixed, with or without jaundice. In such circumstances, cantifient should be immediately discontinued. These events are usually reversible, but in exceedingly rare circumstances death ha

events are usually reversible, but in exceedingly rare circumstances death has occurred. Bood courted blood count changes (leukopenia, granulocytopenia, and thrombocytopenia) have occurred in a tew patients. These were usually reversible. Rate cases of agranulocytosis, pancytopenia, sometimes with marrow hypoplasia, and aplastic anemia have exceedingly rare cases of acquired immune hemotytic anemia have been reported. Endocrine. Controlled studies in animals and man have shown no stimulation of any pituitary hormone by raintifient and no anitiandrogenic activity, and cimetidine-induced gynecomastia and impotence in hypersecretory patients have resolved when raintifien has been substituted. However, occasional cases of gynecomastia, impotence, and loss of libido have been returned in the patients receiving raintifient, but the incidence did not different and patients receiving raintifient, but the incidence did not different and patients receiving raintifient, but the incidence did not different and patients receiving raintifient, but the incidence did not different and patients receiving raintifient, but the incidence did not different and patients receiving raintifient, but the incidence did not different and patients receiving raintifient, and the receiving raintifient, and the receiving raintifient and patients receiving raintifient expensions (e.g., bronchospasm, fewer, rash, essinophilia), anaphylaus, angioneurotic debma, and small increases in serum creatinine.

rash, gosnophila), anaphylaxis, angioneurotic deema, and small increases in serum creatinine. OVERDOSAGE: There has been limited experience with overdosage. Reported acute ingestions of up to 18 g orally have been associated with transient adverse effects similar to those encountered in normal clinical experience (see ADVERS REACTIONS). In addition, abnormalities of garl and hypotension have been reported. When overdosage occurs, the usual measures to remove unabsorbed material from the gastrointestinal tract, clinical monitoring, and supportive

twice the pretreatment levels in 6 of 12 subjects receiving 100 mg q.i.d. intravenously for 7 days, and in 4 of 24 subjects receiving 50 mg q.i.d. intravenously for 5 days. There have been occasional reports of hepatitis, hepatocellular or hepatocanalicular or mixed, with or without jauncice. In such circumstances, rantidine should be immediately discontinued. These events are usually reversible, but in exceedingly rare circumstances death

intravenously for 5 days. There have been occasional reports of hepatitis, hepatocellular or hepatocanalicular or mixed, with or without jaundice. In such circumstances, anniformes should be immediately discontinued. These events are usually reversible, but in exceedingly rare circumstances death has occurred. Musculosidelata? Rare reports of arthralgias and myalgias. Microscopical blood count changes (leukopenia, granulocytospenia, have occurred in a lew patients. These were usually reversible. Blood count changes (leukopenia, granulocytospenia, have occurred in a lew patients. These were usually reversible. Rare cases of agranulocytospenia, parentlerines with a control of the patients of the patients. These were usually reversible. Rare cases of agranulocytospenia, parentlerines with a control of the patients of the patients. These were usually reversible. Rare cases of agranulocytospenia, parentlerines with a control of the patients of the patients. The patients of the patients. The patients of the patie

ysis. HOW SUPPLIED: Ranitidine tablets USP, for oral administration, are sup-

ed as: 15**8 mg**: round, off-white, unscored tablets, film-coated pink, debossed 17**0**5 on one side and plain on the reverse side, in bottles of 60, 100, 500 d 1000.

and 1000.

300 mg: round, off-white, unscored tablets, film-coated orange, debossed 66 706 on one side and plain on the reverse side, in bottles of 30, 250 and 1000. Store at controlled room temperature 159-300C (509-869F). Store in a dry place, and protect from light. Replace cap securely after each opening. Disperse in a tight, light-resistant container.

Caution: Federal law prohibits dispensing without prescription. 7162-6

Manufactured By Geneva Pharmaceuticals, Inc. Broomfield, CO 80020





Manufactured By Geneva Pharmaceuticals, Inc. Broomfield, CO 80020

EXP.:

A18 20 mos





Geneva phormoceuticols, inc

EXP:





Each tablet contains: Ranitidine hydrochloride equivalent to 300 mg

Usual Dosage: See package insert.

Store at controlled room temperature 15°-30°C (59°-86°F) in a dry place. Protect from light. Replace cap securely after each opening. Dispense in a tight, light-resistant container.

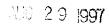
KEEPTHIS AND ALL DRUGS OUT OF THE REACH OF CHILDREN.

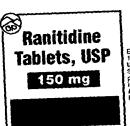
Rev. 96-6M

Manufactured By Geneva Pharmaceuticals, Inc. Broomfield, CO 80020

LOT:

EXP.:





Jeneva phormoceufficals, inc





29 1997





Geneva phormoceuficos inc

EXP.:

25 1007



ATO 20 1007

Each tablet contains: Ranitidine hydrochloride equivalent to 150 mg

of rantidine.

Usual Dosage: See package insert.

Store at controlled room temperature 15°-30°C (59°-86°F) in a dry place. Protect from light. Replace cap securely after each opening. Dispense in a tight, light-resistant container.

KEEPTHIS AND ALL DRUGS OUT OF THE REACH OF CHILDREN.

C96/6

Rev. 96-6M

Manufactured By Geneva Pharmaceuticals, Inc. Broomfield, CO 80020

Tablets, USP

150 mg

LOT: EXP.: